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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/044,903	01/15/2002	Takeshi Funahashi	Q66580	4967

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EXAMINER	
TABATABAI, ABOLFAZL	
ART UNIT	**PAPER NUMBER**
2625	

DATE MAILED: 01/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/044,903	FUNAHASHI, TAKESHI	
	Examiner	Art Unit	
	Abolfazl Tabatabai	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 January 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/3/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito (U S 5,210,415) in view of Agano (U S 6,573,507 B1).

Regarding claim 1, Ito discloses a method of forming an energy subtraction image, comprising the steps of:

i) obtaining a plurality of radiation image signals respectively representing a plurality of radiation images of an object (column 3, lines 39-52), which radiation images have been formed with several kinds of radiation having different energy distributions (column 10, lines 50-63); and,

ii) forming an energy subtraction image signal from the plurality of the radiation image signals (column 3, lines 29-35).

However, Ito is silent about the specific details wherein the energy subtraction image signal is formed as an energy subtraction image signal having a pixel density lower than the pixel density of each of the radiation image signals.

In the same field of endeavor (medical image), however, Agano discloses radiation image read-out method and apparatus with transformed pixel density based on radiation

image size comprising the energy subtraction image signal is formed as an energy subtraction image signal having a pixel density lower than the pixel density of each of the radiation image signals (column 14, lines 27-34 and column 16, lines 35-42).
It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use lowering a pixel density of radiation as taught by Agano in the system of Ito because Agano provides Ito an improved system for carrying out the radiation image read-out method wherein the improvement comprises the provision of pixel density transforming process on the image signal and in accordance with a pixel size, which is determined in accordance with a desired image size. The Specific object of this system is to provide a solid-state radiation detector for use in radiation image read-out method.

Regarding claim 2, Ito is silent about the specific details as defined in claim 1 wherein the pixel density of each of the radiation image signals is lowered, a plurality of low pixel density radiation image signals being thereby acquired, subtraction processing is performed by utilizing the plurality of the thus acquired low pixel density radiation image signals, and the energy subtraction image signal having the pixel density lower than the pixel density of each of the radiation image signals is thereby formed.
In the same field of endeavor (medical image), however, Agano discloses radiation image read-out method and apparatus with transformed pixel density based on radiation image size comprising the pixel density of each of the radiation image signals is lowered (column 13, lines 1-10), a plurality of low pixel density radiation image signals being thereby acquired (column 7, lines 10-18), subtraction processing is performed by

utilizing the plurality of the thus acquired low pixel density radiation image signals (column 16, lines 35-42), and the energy subtraction image signal having the pixel density lower than the pixel density of each of the radiation image signals is thereby formed (column 14, lines 27-34).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use lowering a pixel density of radiation as taught by Agano in the system of Ito because Agano provides Ito an improved system for carrying out the radiation image read-out method wherein the improvement comprises the provision of pixel density transforming process on the image signal and in accordance with a pixel size, which is determined in accordance with a desired image size. The Specific object of this system is to provide a solid-state radiation detector for use in radiation image read-out method.

Regarding claim 3, Ito discloses an apparatus for forming an energy subtraction image, comprising:

i) means for obtaining a plurality of radiation image signals respectively representing a plurality of radiation images of an object (column 3, lines 39-52), which radiation images have been formed with several kinds of radiation having different energy distributions (column 10, lines 50-63); and,

ii) image processing means for forming an energy subtraction image signal from the plurality of the radiation image signals (column 3, lines 29-35).

However, Ito is silent about the specific details wherein the image processing means forms the energy subtraction image signal as an energy subtraction image signal having a pixel density lower than the pixel density of each of the radiation image signals.

In the same field of endeavor (medical image), however, Agano discloses radiation image read-out method and apparatus with transformed pixel density based on radiation image size comprising the image processing means forms the energy subtraction image signal as an energy subtraction image signal having a pixel density lower than the pixel density of each of the radiation image signals (column 14, lines 27-34 and column 16, lines 35-42).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use lowering a pixel density of radiation as taught by Agano in the system of Ito because Agano provides Ito an improved system for carrying out the radiation image read-out method wherein the improvement comprises the provision of pixel density transforming process on the image signal and in accordance with a pixel size, which is determined in accordance with a desired image size. The Specific object of this system is to provide a solid-state radiation detector for use in radiation image read-out method.

Regarding claim 4, Ito is silent about the specific details as defined in claim 3 wherein the image processing means comprises:

a pixel density transforming section for receiving the plurality of the radiation image signals, and lowering the pixel density of each of the radiation image signals in order to form a plurality of low pixel density radiation image signals; and,

an operation processing section for receiving the plurality of the low pixel density radiation image signals, which have been formed by the pixel density transforming section, and forming the energy subtraction image signal, which has the pixel density lower than the pixel density of each of the radiation image signals, from the low pixel density radiation image signals.

In the same field of endeavor (medical image), however, Agano discloses radiation image read-out method and apparatus with transformed pixel density based on radiation image size comprising the steps of:

a pixel density transforming section for receiving the plurality of the radiation image signals (fig. 1 element 13), and lowering the pixel density of each of the radiation image signals in order to form a plurality of low pixel density radiation image signals(column 14, lines 1-10); and,

an operation processing section for receiving the plurality of the low pixel density radiation image signals (column 10, lines 1-5 and column 16, lines 61-62), which have been formed by the pixel density transforming section, and forming the energy subtraction image signal, which has the pixel density lower than the pixel density of each of the radiation image signals, from the low pixel density radiation image signals (column 14, lines 27-34).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a pixel density transforming section and an operating processing section as taught by Agano in the system of Ito because Agano provides Ito an improved system for carrying out the radiation image read-out method wherein the

improvement comprises the provision of pixel density transforming process on the image signal and in accordance with a pixel size, which is determined in accordance with a desired image size. The Specific object of this system is to provide a solid-state radiation detector for use in radiation image read-out method.

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito (U S 5,210,415) and Agano (U S 6,573,507 B1) as applied to claim 3 above, and further in view of Shimura (U S 4,859,849).

Regarding claim 5, Ito and Agano are silent about the specific details as defined in claim 3 or 4 wherein the apparatus further comprises means for transferring the plurality of the radiation image signals and the energy subtraction image signal toward an external device or feeding out the plurality of the radiation image signals and the energy subtraction image signal toward storage means for storing the plurality of the radiation image signals and the energy subtraction image signal.

In the same field of endeavor (medical image), however, Shimura discloses radiation image recording and read-out apparatus comprises transferring the plurality of the radiation image signals and the energy subtraction image signal toward an external device or feeding out the plurality of the radiation image signals and the energy subtraction image signal toward storage means for storing the plurality of the radiation image signals and the energy subtraction image signal (column 5, lines 41-46 and column 9, lines 23-26).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use transferring the plurality of the radiation image signals and

the energy subtraction image signal toward an external device as taught by Shimura in the system of Ito because Shimura provides Ito an improved system which particularly relates to a radiation image recording and read-out system which the stimulable phosphor sheet are circulated and reused for recording radiation images. The light emitted from the stimulable phosphor sheet when the sheet is exposed to the stimulating rays is photoelectrically detected and converted to an electric image signal, which is processed as desired to reproduce a visible image having an improved quality, particularly a high diagnostic efficiency and accuracy.

Other Prior Art

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Arakawa (U S 6,252,932 B1) discloses method and apparatus for acquiring image information for energy subtraction processing.

Karellas (U S 6,445,767 B1) discloses system for quantitative radiographic imaging.

Nakajima et al (U S 4,710,875) disclose alignment procedure for radiation images undergoing subtraction processing.

Shimura (U S 4,761,739) discloses density correction method and apparatus for energy subtraction image.

Contact Information

5. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to ABOLFAZL TABATABAI whose telephone number is (703) 306-5917.

The Examiner can normally be reached on Monday through Friday from 9:30 a.m. to 7:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Mehta Bhavesh M, can be reached at (703) 308-5246. The fax phone number for organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Abolfazl Tabatabai

Patent Examiner

Group Art Unit 2625

January 1, 2005

A- Tabatabai